CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 12/07/2021

TO: Laura Dietrich – SER

FROM: Nicole Krueger – SER Nicole Krueger

SUBJECT: Water Quality-Based Effluent Limitations for the City of Cedarburg
WPDES Permit No. WI-0020222-11

This is in response to your request for an evaluation of the need for water quality-based effluent limitations (WQBELs) using chapters NR 102, 104, 105, 106, 207, 210, 212, and 217 of the Wisconsin Administrative Code (where applicable), for the discharge from Cedarburg in Ozaukee County. This municipal wastewater treatment facility (WWTF) discharges to Cedar Creek, located in the Cedar Creek Watershed in the Milwaukee River Basin. This discharge is included in the Milwaukee River TMDL as approved by EPA in March 2018. The evaluation of the permit recommendations is discussed in more detail in the attached report.

Based on our review, the following recommendations are made on a chemical-specific basis at Outfall 001:

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
BOD_5						1
November – April			15 mg/L 344 lbs/day	15 mg/L		
May – October			10 mg/L 229 lbs/day	10 mg/L		
TSS						2
Dissolved Oxygen		6.0 mg/L				1
pH	9.0 s.u.	6.0 s.u.				1
Bacteria						3
E. coli				126 #/100 mL geometric mean		
Ammonia Nitrogen						1
November – March	21 mg/L		13 mg/L	6.4 mg/L		
April	21 mg/L		8.0 mg/L	4.0 mg/L		
May – September			5.3 mg/L	3.3 mg/L		
October			11 mg/L	5.7 mg/L		
Phosphorus						2,4
AM Interim Limits				0.8 mg/L	0.6 mg/L	
Final				TMDL		
Chloride			490 mg/L 11,000 lbs/day	**490 mg/L**		5,6
Mercury						1,7
Temperature						1,7
TKN, Nitrate+Nitrite, and Total Nitrogen						8
Acute WET						9,10
Chronic WET				1.3 TUc		9,10

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Footnotes:

1. No changes from the current permit.
2. The TSS and phosphorus mass limits are based on the Total Maximum Daily Load (TMDL) for the Milwaukee River Basin to address phosphorus water quality impairments within the TMDL area. The TMDL was approved by EPA in March 2018. Some of the months of TSS mass limits are continued from the current permit.

Month	Monthly Average TP Effluent Limit (lbs/day)	Weekly Average TSS Effluent Limit (lbs/day)	Weekly Average TSS Effluent Limit (mg/L)	Monthly Average TSS Effluent Limit (mg/L)
Jan	3.71	323	15	12
Feb	4.19	344	12	12
Mar	3.88	344	12	12
Apr	4.25	344	12	12
May	5.14	344	15	12
Jun	4.50	344	12	12
Jul	3.88	344	12	12
Aug	3.32	344	12	12
Sep	3.67	344	12	12
Oct	3.46	344	12	12
Nov	3.73	344	15	12
Dec	3.54	344	15	12

3. Bacteria limits apply during the disinfection season of May through September. Additional final limit: No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 count/100 mL.
4. Under the phosphorus Adaptive Management (AM) Plan, the interim limits (and technology-based effluent limit (TBEL)) of 0.8 mg/L, monthly average and 0.6 mg/L, six-month average should be effective upon permit reissuance. The final water quality based effluent limits are the Milwaukee River Basin TMDL mass limits listed in the above table.
5. A wet weather mass limit of 31,000 lbs/day is also required.
6. Additional limits to comply with the expression of limits requirements in ss. NR 106.07 and NR 205.065(7), Wis. Adm. Codes, are included in bold.
7. Monitoring only.
8. As recommended in the Department's October 1, 2019 Guidance for Total Nitrogen Monitoring in Wastewater Permits, quarterly total nitrogen monitoring is recommended for all municipal major permittees. Total Nitrogen is the sum of nitrate (NO_3), nitrite (NO_2), and total kjeldahl nitrogen (TKN) (all expressed as N).
9. Annual acute and chronic WET tests are recommended. The Instream Waste Concentration (IWC) to assess chronic test results is 76%. According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), chronic testing shall be performed using a dilution series of 100%, 75%, 50%, 25% & 12.5% and the dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from Cedar Creek.
10. Sampling WET concurrently with any chemical-specific toxic substances is recommended. Tests should be done in rotating quarters, to collect seasonal information about this discharge and should continue after the permit expiration date (until the permit is reissued).

Please consult the attached report for details regarding the above recommendations. If there are any questions or comments, please contact Nicole Krueger at Nicole.Krueger@wisconsin.gov or Diane Figiel at Diane.Figiel@wisconsin.gov.

Attachments (3) – Narrative, Thermal Table & Map

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Attachment #1

Water Quality-Based Effluent Limitations for
City of Cedarburg

WPDES Permit No. WI-0020222-10

Prepared by: Nicole Krueger

PART 1 – BACKGROUND INFORMATION

Facility Description

The City of Cedarburg operates a municipal wastewater treatment plant with an annual average design flow of 2.75 MGD and serves an approximate population of 11,500 people with one significant industrial user. Treatment consists of a bar screen, washer press, grit classifier, a three ring oxidation ditch and two secondary clarifiers. The three ring oxidation ditch consists of an anaerobic channel at the beginning for biological nutrient (phosphorus) removal, and an anoxic zone at the beginning of the first (outer) ditch for denitrification. Ferrous chloride is added to the outer ring to aid in phosphorus removal. The oxidation ditches are aerated with mechanical aerators. The effluent is disinfected with ultraviolet light and flows through a cascade aerator before being discharged to Cedar Creek. Waste sludge is gravity thickened and stabilized with aerobic digestion before being hauled off-site to another permitted treatment facility. In 2016, the Cedarburg WWTP signed a contract with the Sheboygan WWTP to haul sludge to the Sheboygan WWTP. If sludge is land applied it must be applied onto Department approved agricultural sites.

Attachment #2 is a map of the area showing the approximate location of Outfall 001.

Existing Permit Limitations

The current permit, expiring on 03/31/2022, includes the following effluent limitations and monitoring requirements.

Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
BOD_5						1
November – April			15 mg/L 344 lbs/day	15 mg/L 10 mg/L		
May – October			10 mg/L 229 lbs/day			
TSS			15 mg/L 344 lbs/day	15 mg/L		
Dissolved Oxygen		6.0 mg/L				1
pH	9.0 s.u.	6.0 s.u.				1
Fecal Coliform May – September			656#/100 mL geometric mean	400#/100 mL geometric mean		
Ammonia Nitrogen						
November – March	21 mg/L		13 mg/L	6.4 mg/L		
April	21 mg/L		8.0 mg/L	4.0 mg/L		
May – September			5.3 mg/L	3.3 mg/L		
October			11 mg/L	5.7 mg/L		

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Parameter	Daily Maximum	Daily Minimum	Weekly Average	Monthly Average	Six-Month Average	Footnotes
Phosphorus Interim Final				 0.8 mg/L TMDL		2
Chloride						3
Mercury						3
Temperature						3
WET						4

Footnotes:

1. These limitations are not being evaluated as part of this review. Because the water quality criteria (WQC), reference effluent flow rates, and receiving water characteristics have not changed, limitations for these water quality characteristics do not need to be re-evaluated at this time.
2. A compliance schedule is in the current permit to meet the Milwaukee River TMDL limits below by April 2026.

Month	**Monthly Average TP Effluent Limit (lbs/day)**
Jan	3.71
Feb	4.19
Mar	3.88
Apr	4.25
May	5.14
Jun	4.50
Jul	3.88
Aug	3.32
Sep	3.67
Oct	3.46
Nov	3.73
Dec	3.54

3. Monitoring only.
4. Acute and chronic WET tests are required annually. The instream waste concentration (IWC) is 78% for chronic tests.

Receiving Water Information

- Name: Cedarburg Creek
- Waterbody Identification Code (WBIC): 21300
- Classification used in accordance with chs. NR 102 and 104, Wis. Adm. Code: Warm Water Sport Fish (WWSF) community, non-public water supply. (Cold Water and Public Water Supply criteria are used for bioaccumulating compounds of concern, because the discharge is within the Great Lakes basin.)
- Low flows used in accordance with chs. NR 106 and 217, Wis. Adm. Code: The following 7-Q_{10} and 7-Q_2 values are from USGS for Station (04086500) updated on 03/05/2021, where Outfall 001 is located.

7-Q_{10} = 5.3 cfs (cubic feet per second)
7-Q_2 = 13 cfs
90-Q_{10} = 11 cfs (85% of the 7Q_2)
Harmonic Mean Flow = 24.7 cfs using a drainage area of 124 mi^2

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
7-Q_{10} (cfs)	11	13	23	48	26	13	9.1	8.2	9.1	11	16	13
7-Q_2 (cfs)	33	34	69	87	54	33	21	18	18	25	37	38

*The previous WQBEL memo used a 7-Q_{10} of 4.56 cfs and a 7-Q_2 of 11.4 cfs.

- Hardness = 339 mg/L as $CaCO_3$. This value represents the geometric mean of data from 11/06/2019 to 02/18/2020.
- % of low flow used to calculate limits in accordance with s. NR 106.06(4)(c)5., Wis. Adm. Code: 25%
- Source of background concentration data: Metals data from Cedar Creek is used for this evaluation The numerical values are shown in the tables below. If no data is available, the background concentration is assumed to be negligible and a value of zero is used in the computations. Background data for calculating effluent limitations for ammonia nitrogen are described later.
- Multiple dischargers: None
- Impaired water status: The immediate receiving water is 303(d) listed as impaired for PCBs.

Effluent Information

- Design flow rate(s):
  Annual average = 2.75 MGD (Million Gallons per Day)
  Peak daily = 7.85 MGD
  For reference, the actual average flow from 04/01/2017 to 09/30/2021 was 2.13 MGD.
- Hardness = 431 mg/L as $CaCO_3$. This value represents the geometric mean of data from the permit reissuance application from 04/01/2021 to 04/15/2021.
- Acute dilution factor used in accordance with s. NR 106.06(3)(c), Wis. Adm. Code: Not applicable – this facility does not have an approved Zone of Initial Dilution (ZID).
- Water source: Domestic wastewater with water supply from wells
- Additives: Ferric chloride is added for phosphorus removal.
- Effluent characterization: This facility is categorized as a major municipal, so the permit application required effluent sample analyses for all the "priority pollutants" except for the Dioxins and Furans as specified in s. NR 200.065, Table 1, Wis. Adm. Code.
- Effluent data for substances for which a single sample was analyzed is shown in the tables in Part 2 below, in the column titled "MEAN EFFL. CONC.". Otherwise, substances with multiple effluent data are shown in the tables below or in their respective parts in this evaluation.

Sample Date	Copper µg/L	Sample Date	Copper µg/L	Sample Date	Copper µg/L
4/1/2021	12	4/19/2021	11	5/10/2021	9.4
4/7/2021	17	4/27/2021	12	5/13/2021	11
4/12/2021	15	5/3/2021	10	5/17/2021	16
4/15/2021	20	5/6/2021	11		
1-day P_{99} = 23 µg/L					
4-day P_{99} = 18 µg/L					

	Chloride mg/L	Mercury ng/L
1-day P_{99}	543	1.3
4-day P_{99}	473	0.90
30-day P_{99}	432	0.68
Mean	410	0.58
Std	51.0	0.21
Sample size	216	31
Range	240 – 520	0.133 – 1.06
Dates	04/02/207 – 09/08/2021	10/20/2010 – 07/06/2021

The following table presents the average concentrations and loadings at Outfall 001 from 04/01/2017 to 09/30/2021 for all parameters with limits in the current permit to meet the requirements of s. NR 201.03(6), Wis. Adm. Code:

Parameter Averages with Limits

	Average Measurement	Average Mass Discharged
BOD_5	2.67 mg/L*	43 lbs/day
TSS	2.42 mg/L*	42 lbs/day
pH field	7.7 s.u.	
Phosphorus	0.24 mg/L	4.5 lbs/day
Ammonia Nitrogen	0.04 mg/L*	
Dissolved Oxygen	7.84 mg/L	
Fecal Coliform	10.4 #/100 mL*	

*Results below the level of detection (LOD) were included as zeroes in calculation of average.

PART 2 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR TOXIC SUBSTANCES – EXCEPT AMMONIA NITROGEN

Permit limits for toxic substances are required whenever any of the following occur:

1. The maximum effluent concentration exceeds the calculated limit (s. NR 106.05(3), Wis. Adm. Code)
2. If 11 or more detected results are available in the effluent, the upper 99th percentile (or P_{99}) value exceeds the comparable calculated limit (s. NR 106.05(4), Wis. Adm. Code)
3. If fewer than 11 detected results are available, the mean effluent concentration exceeds 1/5 of the calculated limit (s. NR 106.05(6), Wis. Adm. Code)

Acute Limits based on 1-Q_{10}

Daily maximum effluent limitations for toxic substances are based on the acute toxicity criteria (ATC), listed in ch. NR 105, Wis. Adm. Code. Previously daily maximum limits for toxic substances were calculated as two times the ATC. However, changes to ch. NR 106, Wis. Adm. Code, (September 1, 2016) require the Department to calculate acute limitations using the same mass balance equation as used for other limits along with the 1-Q_{10} receiving water low flow to determine if more restrictive effluent limitations are needed to protect the receiving stream from discharges which may cause or contribute to an exceedance of the acute water quality standards. The mass balance equation is provided below.

$$\text{Limitation} = \frac{(WQC)\,(Qs + (1-f)\,Qe) - (Qs - f\,Qe)\,(Cs)}{Qe}$$

Where:

WQC =Acute toxicity criterion or secondary acute value according to ch. NR 105, Wis. Adm. Code.

Qs = average minimum 1-day flow which occurs once in 10 years (1-day Q_{10}) if the 1-day Q_{10} flow data is not available = 80% of the average minimum 7-day flow which occurs once in 10 years (7-day Q_{10}).

Qe = Effluent flow (in units of volume per unit time) as specified in s. NR 106.06(4)(d), Wis. Adm. Code.

f = Fraction of the effluent flow that is withdrawn from the receiving water, and

Cs = Background concentration of the substance (in units of mass per unit volume) as specified in s. NR 106.06(4)(e), Wis. Adm. Code.

If the receiving water is effluent dominated under low stream flow conditions, the 1-Q_{10} method of limit calculation produces the most stringent daily maximum limitations and should be used while making reasonable potential determinations. This is not the case for Cedarburg and the limits are set based on two times the acute toxicity criteria.

The following tables list the calculated WQBELs for this discharge along with the results of effluent sampling for all the detected substances. All concentrations are expressed in terms of micrograms per Liter (µg/L), except for hardness and chloride (mg/L) and mercury (ng/L).

Daily Maximum Limits based on Acute Toxicity Criteria (ATC)

RECEIVING WATER FLOW = 4.24 cfs, (1-Q_{10} (estimated as 80% of 7-Q_{10})), as specified in s. NR 106.06(3)(bm), Wis. Adm. Code.

SUBSTANCE	REF. HARD.* mg/L	ATC	MEAN BACK-GRD.	MAX. EFFL. LIMIT**	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	1-day P_{99}	1-day MAX. CONC.
Arsenic		340		661	132	<0.28		
Cadmium	431	55.1	0.2	110	21.9	<1.3		
Chromium	301	4446	3	8873	1775	<2.5		
Copper	431	61.6	6.31	117			23	20
Lead	356	365	10.3	718	144	<5.9		
Mercury (ng/L)		830	0.2	1657			1.3	1.06
Nickel	268	1080	20	2137	427	<2.6		
Zinc	333	345	21.7	667	133.3	25		
Chloride (mg/L)		757	100	1412			540	

* The indicated hardness may differ from the effluent hardness because the effluent hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the acute criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

* * The 2 × ATC method of limit calculation yields a more restrictive limit than consideration of ambient concentrations and 1-Q_{10} flow rates per the changes to s. NR 106.07(3), Wis. Adm. Code, effective 09/01/2016.

Weekly Average Limits based on Chronic Toxicity Criteria (CTC)

RECEIVING WATER FLOW = 1.325 cfs (¼ of the 7-Q_{10}), as specified in s. NR 106.06(4)(c), Wis. Adm. Code

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SUBSTANCE	REF. HARD.* mg/L	CTC	MEAN BACK-GRD.	WEEKLY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	4-day P_{99}	4-day MAX
Arsenic		152		200	39.9	<0.28		
Cadmium	175	3.82	0.2	4.95	1.0	<1.3		
Chromium	301	326	3	426	85.3	<2.5		
Copper	339	29.4	6.31	36.6				
Lead	339	91.1	10.3	116	23.3	<5.9		
Mercury (ng/L)		440	0.2	577			0.90	
Nickel	268	120	20	151	30.3	<2.6		
Zinc	333	345	21.7	445	89.1	25		
Chloride (mg/L)		395	100	487			471	506

* The indicated hardness may differ from the receiving water hardness because the receiving water hardness exceeded the maximum range in ch. NR 105, Wis. Adm. Code, over which the chronic criteria are applicable. In that case, the maximum of the range is used to calculate the criterion.

Monthly Average Limits based on Wildlife Criteria (WC)

RECEIVING WATER FLOW = 2.76 cfs (¼ of the 90-Q_{10}), as specified in s. NR 106.06(4), Wis. Adm. Code

SUBSTANCE	WC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	30-day P_{99}
Mercury (ng/L)	1.3	0.2	1.3	0.68

Monthly Average Limits based on Human Threshold Criteria (HTC)

RECEIVING WATER FLOW = 6.43 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HTC	MEAN BACK-GRD.	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.	30-day P_{99}
Cadmium	370	0.2	929	185.8	<1.3	
Chromium (+3)	3818000	3	9591725	1918345	<2.5	
Lead	140	10.3	336	67.2	<5.9	
Mercury (ng/L)	1.5	0.2	1.5			0.58
Nickel	43000	20	107996	21599	<2.6	

Monthly Average Limits based on Human Cancer Criteria (HCC)

RECEIVING WATER FLOW = 6.43 cfs (¼ of Harmonic Mean), as specified in s. NR 106.06(4), Wis. Adm. Code.

SUBSTANCE	HCC	MO'LY AVE. LIMIT	1/5 OF EFFL. LIMIT	MEAN EFFL. CONC.
Arsenic	13.3	33.4	6.68	<0.28

In addition to evaluating the need for limits for each individual substance for which HCC exist, s. NR 106.06(8), Wis. Adm. Code, requires the evaluation of the cumulative cancer risk. Because no effluent limits are needed based on HCC, determination of the cumulative cancer risk is not needed per s. NR 106.06(8), Wis. Adm. Code.

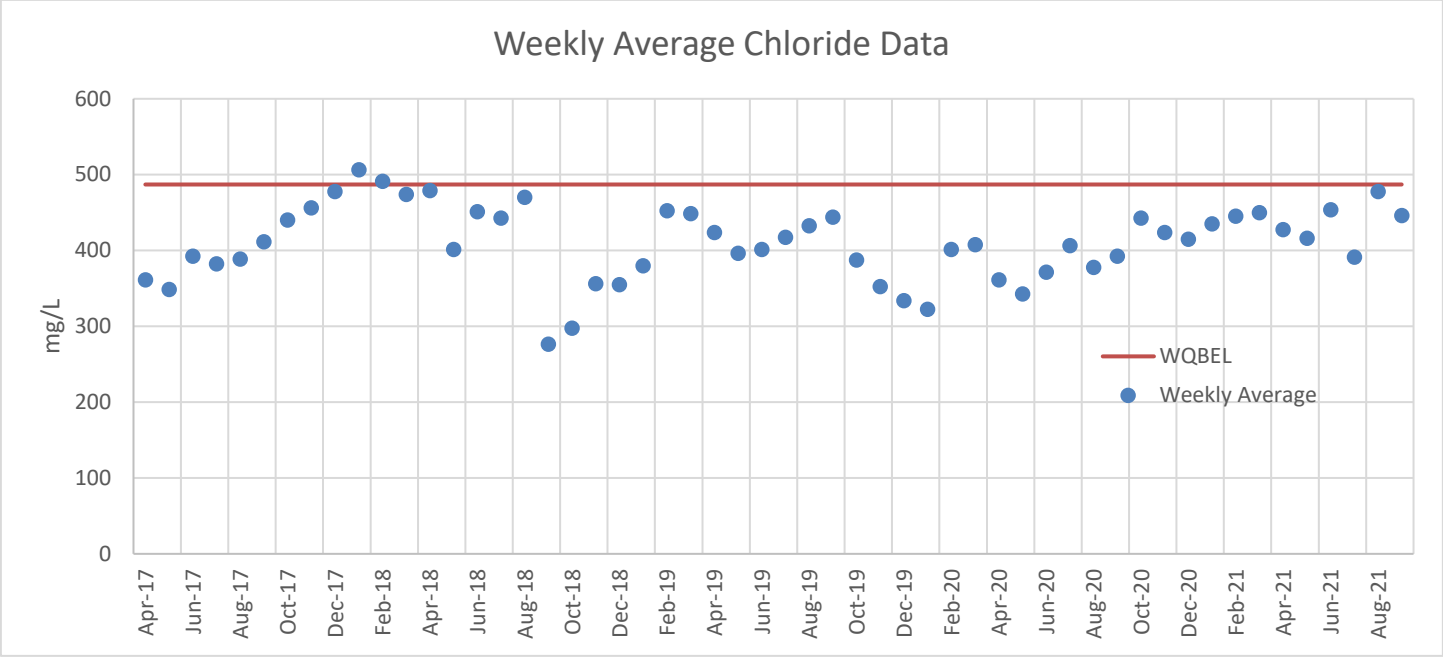
Conclusions and Recommendations

Based on a comparison of the effluent data and calculated effluent limitations, effluent limitations are required for chloride.

Chloride – Considering available effluent data from the current permit term (04/01/2017 to 09/30/2021), the 1-day P_{99} chloride concentration is 540 mg/L, the 4-day P_{99} of effluent data is 471 mg/L, and the highest 4-day average was 506 mg/L.

Per s. NR 106.05(3)(b), Wis. Adm. Code, a weekly average limit of 490 mg/L (rounded to two significant figures**) is recommended to be included in the reissued permit** because there were two 4-day periods during the current permit term that had a 4-day average concentration greater than the calculated WQBEL.

Below is a graph of the weekly average chloride concentrations compared to the calculated WQBEL.



Cedarburg has met the calculated WQBEL of 490 mg/L over 96% of the time during the current permit term but a compliance schedule may be included in the reissued permit if deemed necessary.

Because Cedarburg is a continuous discharger subject to ch. NR 210 Wis. Adm. Code, weekly average and monthly average limits are required whenever a limit is necessary. Because a weekly average limitation is determined necessary to protect water quality, a monthly average limitation shall also be included in the permit and set equal to the weekly average limit. **Therefore, a monthly average limit equal to the weekly average limit of 490 mg/L is also recommended in the reissued permit.**

Per s. NR 106.88(1)(c) Wis. Adm. Code, whenever a concentration-based chloride WQBEL is required in the permit, corresponding mass limits are also necessary. The weekly average mass limit of 11,000

lbs/day (487 mg/L × 2.75 MGD × 8.34); and an alternative wet weather mass limit of 31,000 lbs/day (487 mg/L × 7.7 MGD × 8.34) are included with the weekly average concentration limit.

Four samples per month (on consecutive days) are recommended.

Mercury – The WQBEL for total recoverable mercury is set equal to the most stringent criterion of 1.3 ng/L, according to s. NR 106.06(6), Wis. Adm. Code, because the background concentration in the receiving water and similar inland streams is known to exceed 1.3 ng/L.

The current permit requires annual monitoring of the influent and effluent for total recoverable mercury. A total of 31 effluent sampling results are available from 10/20/2010 to 07/06/2021 for total recoverable mercury. The average concentration was 0.58 ng/L, and the maximum was 1.06 ng/L. Because the 30-day P_{99} of available data (0.68 ng/L) is less than the most stringent WQBEL of 1.3 ng/L, **no WQBEL for mercury is required for permit reissuance. Monitoring is recommended to continue in the reissued permit.**

Benzo(ghi)perylene – Benzo(ghi)perylene was reported as detected in the permit application at 0.0086 µg/L but was reported as nondetect in the previous application. There is not currently data to calculate secondary values for this parameter, so no limits or monitoring are recommended.

PART 3 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BOD, TSS AND AMMONIA NITROGEN

The weekly and monthly average BOD, TSS and ammonia nitrogen limits could potentially increase with the increase in the receiving water low flows. However, to allow an increase in a limit above an existing limit the facility must demonstrate the need for the higher limits consistent with s. NR 207.04(1), Wis. Adm. Code.

If Cedarburg would like to request an increase to the existing permit limits for BOD_5, TSS, or ammonia nitrogen an assessment of their effluent data consistent with the requirements of ss. NR 207.04(1)(a) and (c), Wis. Adm. Code, must be provided. This evaluation is on a parameter by parameter basis and includes consideration of operations, maintenance and temporary upsets. If the facility can successfully demonstrate the need for increased effluent limitations required in ch. NR 207, Wis. Adm. Code, then a recalculation of the specific effluent limitation will be provided.

An initial review suggests that the requirements of s. NR 207.04(1)(a), Wis. Adm. Code, do not appear to be met based on BOD_5, TSS, and Ammonia Nitrogen effluent concentrations based on data from 04/01/2017 to 09/30/2021. **Therefore, the current weekly and monthly average limits for BOD, TSS and Ammonia Nitrogen are required to be retained in the reissued permit consistent with s. NR 207.04(2), Wis. Adm. Code.**

See the TSS section for TMDL-based limits.

PART 4 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR BACTERIA

On May 1, 2020, revisions to chs. NR 102 and NR 210, Wis. Adm. Codes, became effective which replace fecal coliform limits with new *Escherichia coli* (*E. coli*) limits for protection of recreational uses.

Section NR 210.06(2)(a)1, Wis. Adm. Code, includes two limits which must be included in permits for facilities which are required to disinfect:

1. The geometric mean of *E. coli* bacteria in effluent samples collected in any calendar month may not exceed 126 counts/100 mL.
2. No more than 10 percent of *E. coli* bacteria samples collected in any calendar month may exceed 410 counts/100 mL.

E. coli monitoring is recommended at the same frequency that fecal coliform monitoring is required in the current permit. Because Cedarburg's permit requires weekly monitoring, the 410 counts/100 mL limit will effectively function as a daily maximum limit unless the facility performs additional monitoring. Any additional monitoring beyond what is required by the permit must also be reported on the DMR as required in the standard requirements section of the permit.

These limits are required during May through September. No changes are recommended to the current recreational period and the required disinfection season.

Effluent Data
Cedarburg monitored effluent *E. coli* from 07/06/2021 to 09/27/2021 and a total of 12 results are available. A geometric mean of 126 counts/100 mL was exceeded in 0 times, with a maximum monthly geometric mean of 3.2 counts/100 mL. Effluent data has exceeded 410 counts/100 mL 0 times. The maximum reported value was 16 counts/100 mL. Based on this effluent data it appears that the facility can meet new *E. coli* limits and a compliance schedule is not needed in the reissued permit.

PART 5 – PHOSPHORUS

Technology-Based Effluent Limit
Subchapter II of Chapter NR 217, Wis. Adm. Code, requires municipal wastewater treatment facilities that discharge greater than 150 pounds of Total Phosphorus per month to comply with a monthly average limit of 1.0 mg/L, or an approved alternative concentration limit.

Because Cedarburg currently has a limit of 0.8 mg/L, this limit should be retained in the reissued permit.

Total Maximum Daily Load
The Milwaukee River Basin total maximum daily load (TMDL) report addresses phosphorus water quality impairments within the Milwaukee River Basin and provides waste load allocations (WLAs) required to meet water quality standards. Effluent limitations based on these WLAs must be included in WPDES permits according to s. NR 217.16, Wis. Adm. Code. The TMDL-derived phosphorus limits may be included in lieu of or in addition to the calculated limits upon permit reissuance or modification if certain conditions are met and the s. NR 217.13, Wis. Adm. Code WQBEL has not yet taken effect.

Because the Milwaukee River Basin TMDL was developed to protect and improve the water quality of all streams and rivers within the basin, and the s. NR 217.13, Wis. Adm. Code, and the WQBEL has not taken effect for Cedarburg, the TMDL-based limits can be included in the WPDES permit in place of the s. NR 217.13, Wis. Adm. Code, WQBEL. The TMDL-based limits should be expressed in a manner consistent with the wasteload allocation and assumptions of the TMDL.

The monthly average total phosphorus (TP) effluent limits in lbs/day are calculated based on the maximum monthly phosphorus WLA given in pounds per month as suggested in the TMDL report and

implementation guidance. The monthly maximum TP WLAs for this facility are found in Appendix A of the Milwaukee River Basin TMDL report. **The monthly average limits shown in the table below are recommended in place of the s. NR 217.13, Wis. Adm. Code, limit, and should be expressed in pounds per day.** For informational purposes, the TMDL mass limits in the following table are equivalent to monthly average concentrations ranging 0.145 mg/L to 0.224 mg/L at the annual average design flow of 2.75 MGD.

Total Phosphorus Wasteload Allocations and Effluent Limits

Month	Monthly Maximum TP WLA[1] (lbs/month)	Days Per Month	Monthly Average TP Effluent Limit[2] (lbs/day)
Jan	115.09	31	3.71
Feb	117.30	28	4.19
Mar	120.42	31	3.88
Apr	127.57	30	4.25
May	159.38	31	5.14
Jun	134.94	30	4.50
Jul	120.26	31	3.88
Aug	102.89	31	3.32
Sep	110.09	30	3.67
Oct	107.40	31	3.46
Nov	112.03	30	3.73
Dec	109.72	31	3.54

Footnotes:
1- Milwaukee River Basin TMDL Appendix A. Monthly Total Suspended Solids Wasteload Allocation by Permitted Point Source. Table A.17 for the Milwaukee River Watershed
2- Monthly Average Total P effluent limit (lbs/day) = monthly Total P WLA (lbs/month) ÷ days per month

Because these WLAs must be included in the reissued permit, no reasonable potential determination is needed.

Effluent Data
The following table summarizes effluent total phosphorus monitoring data from 04/01/2017 to 09/30/2021. Cedarburg cannot currently meet the TMDL-based effluent limits.

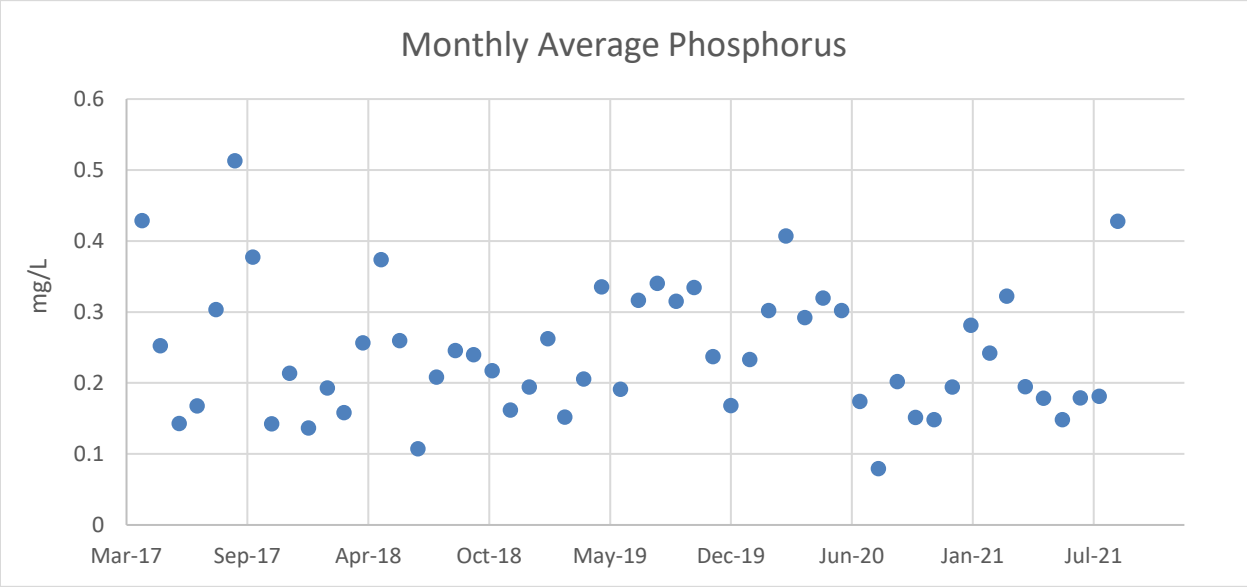
Total Phosphorus Effluent Data

	Phosphorus mg/L	Phosphorus lbs/day
1-day P_{99}	0.70	15.7
4-day P_{99}	0.40	9.20
30-day P_{99}	0.30	5.94
Mean	0.24	4.48
Std	0.12	3.07
Sample size	940	939
Range	0.061 – 0.872	0.852 – 26.1

Adaptive Management Interim Limit

Cedarburg intends to pursue adaptive management (AM) to comply with the phosphorus WQBELs. Since this is the first permit term in which AM is being pursued, the required interim limit is 0.6 mg/L, expressed as a 6-month average and 1.0 mg/L as a monthly average per s. NR 217.18(3)(e)1, Wis. Adm. Code. The permittee may be allowed up to five years to meet this interim limit.

Cedarburg currently has an interim limit of 0.8 mg/L as a monthly average which is recommended to continue in the reissued permit, rather than a monthly average limit of 1.0 mg/L. Below is a graph of the monthly average phosphorus concentrations from 04/01/2017 to 09/30/2021. The highest monthly average during the current permit term was 0.51 mg/L. Because all of the monthly average limits have been below 0.6 mg/L, Cedarburg has demonstrated that they can currently meet the 6-month average of 0.6 mg/L and a compliance schedule is not necessary.



PART 6 – TOTAL SUSPENDED SOLIDS

The TMDL also has wasteload allocations (WLAs) for total suspended solids (TSS). For a municipal facility, the limits for TSS must be expressed as weekly and monthly averages. The current permit includes a weekly and a monthly average limit of 15 mg/L.

Monthly average and weekly average mass effluent limitations derived from the TMDL WLAs should be included in the permit according to the table below, along with the currently imposed concentration limits. Consistent with Section 6.4.1 of the Milwaukee River TMDL Report, in cases where the equivalent TSS concentration limit is $\leq$ 12 mg/L, the effluent limit will be expressed as a concentration of 12 mg/L monthly average.

The projected design flow rate of 3.07 MGD is used to calculate the equivalent concentration limits instead of the current design flow of 2.75 MGD. The TMDL report identified two facilities whose flows are projected to increase significantly by 2035, Cedarburg being one of them. The projected design flow was used in the TMDL calculations and is used in this memo to calculate the corresponding concentration limits.

Total Suspended Solids Wasteload Allocations

Month	Monthly TSS WLA[1] (lbs/month)	Days Per Month	Monthly Ave TSS Effluent Limit[2] (lbs/day)	Equivalent Conc. Limit[3] at 3.07 MGD (mg/L)	Weekly Ave TSS Effluent Limit[4] (lbs/day)	Equivalent Conc. Limit[3] at 3.07 MGD (mg/L)
Jan	5,276.20	31	170.20	6.6	323.38	12.6
Feb	3,896.23	28	139.15	5.4	264.39	10.3
Mar	3,030.82	31	97.77	3.8	185.76	7.3
Apr	3,157.64	30	105.25	4.1	199.98	7.8
May	5,766.30	31	186.01	7.3	353.42	13.8
Jun	4,619.32	30	153.98	6.0	292.56	11.4
Jul	4,370.90	31	141.00	5.5	267.89	10.5
Aug	3,585.46	31	115.66	4.5	219.75	8.6
Sep	4,537.58	30	151.25	5.9	287.38	11.2
Oct	4,665.37	31	150.50	5.9	285.94	11.2
Nov	5,477.75	30	182.59	7.1	346.92	13.5
Dec	5,808.26	31	187.36	7.3	355.99	13.9

Footnotes:
1- Milwaukee River Basin TMDL Appendix A. Monthly Total Suspended Solids Wasteload Allocation by Permitted Point Source. Table A.19 for the Milwaukee River Watershed
2- Monthly average TSS effluent limit (lbs/day) = maximum monthly TSS WLA (lbs/month) ÷ days per month
3- Equivalent Concentration = mass / (annual average design flow * 8.34)
4- Weekly average effluent limit (lbs/day) = monthly average limit (lbs/day) x multiplier

The multiplier used in the weekly average calculation was determined according to implementation guidance. A coefficient of variation was calculated, based on TSS mass monitoring data, to be 0.7. This is the standard deviation divided by the mean of mass data. However, it is believed that the optimization of the wastewater treatment system to achieve the WLA-derived permit limits will reduce effluent variability. Thus, the maximum anticipated coefficient of variation expected by the facility is 0.6. This value, along with monitoring frequency, is used to select the multiplier. The current permit specifies TSS monitoring as 4/week; if a different monitoring frequency is used, the stated limits should be reevaluated.

Because the monthly average limits year-round and the weekly average limits for February – April and June – October equate to concentration limits of less than 12 mg/L, mass-based limits for TSS are not needed for permit reissuance. Instead, **it is recommended that the monthly average limit of 12 mg/L year-round and the weekly average limit of 12 mg/L for February – April and June – October be included in the reissued permit.**

The weekly average limits for November – January and May equate to concentration limits of greater than 12 mg/L, so the mass-based limits for TSS are recommended for these months. Because the current permit has a weekly average mass limit of 344 lbs/day, this limit is recommended to continue in the reissued permit for the months that the TMDL-based mass limits are less restrictive and for all other months without a TMDL-based mass limit. Therefore, **344 lbs/day as a weekly average limit is recommended to continue for February – December. The TMDL-based weekly average limit of 323 lbs/day is recommended for January. The current weekly average limit of 15 mg/L is also recommended to continue in the reissued permit.**

Below is the summary table of limits recommended for TSS:

Attachment #1

Month	Weekly Ave TSS Effluent Limit (lbs/day)	Weekly Ave TSS Effluent Limit (mg/L)	Monthly Ave TSS Effluent Limit (mg/L)
Jan	323	15	12
Feb	344	12	12
Mar	344	12	12
Apr	344	12	12
May	344	15	12
Jun	344	12	12
Jul	344	12	12
Aug	344	12	12
Sep	344	12	12
Oct	344	12	12
Nov	344	15	12
Dec	344	15	12

Limits based on a WLA should be given in a permit regardless of reasonable potential. The following table lists the statistics for effluent TSS as both a concentration and a mass, from 04/01/2017 to 09/30/2021.

	TSS (mg/L)	TSS (lbs/day)
1-day P_{99}	5.8	153
4-day P_{99}	4.1	90.8
30-day P_{99}	2.97	59.3
Mean	2.42	45.1
Std	1.01	29.9
Sample Size	940	936
Range	0 – 6	0 – 309

The TSS data from the current permit term shows that Cedarburg is able to meet the TMDL-based limits upon permit reissuance and a compliance schedule is not necessary.

PART 7 – WATER QUALITY-BASED EFFLUENT LIMITATIONS FOR THERMAL

Surface water quality standards for temperature took effect on October 1, 2010. These regulations are detailed in chs. NR 102 (Subchapter II – Water Quality Standards for Temperature) and NR 106 (Subchapter V – Effluent Limitations for Temperature) of the Wisconsin Administrative Code. Daily maximum and weekly average temperature criteria are available for the 12 different months of the year depending on the receiving water classification.

In accordance with s. NR 106.53(2)(b), Wis. Adm. Code, the highest daily maximum flow rate for a calendar month is used to determine the acute (daily maximum) effluent limitation. In accordance with s. NR 106.53(2)(c), Wis. Adm. Code, the highest 7-day rolling average flow rate for a calendar month is used to determine the sub-lethal (weekly average) effluent limitation. These values were based off actual flow reported from 04/01/2017 to 09/30/2021.

The table below summarizes the maximum temperatures reported during monitoring from 01/01/2020 to 12/31/2020.

Monthly Temperature Effluent Data & Limits

Month	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Weekly Maximum (°F)	Daily Maximum (°F)	Weekly Average Effluent Limitation (°F)	Daily Maximum Effluent Limitation (°F)
JAN	51	52	61	103
FEB	50	51	62	105
MAR	50	51	65	107
APR	53	54	70	120
MAY	58	59	70	94
JUN	64	66	84	97
JUL	67	69	87	92
AUG	70	71	86	89
SEP	67	69	77	87
OCT	64	65	66	91
NOV	61	62	**58**	111
DEC	55	55	59	100

Reasonable Potential

Permit limits for temperature are recommended based on the procedures in s. NR 106.56, Wis. Adm. Code.

- An acute limit for temperature is recommended for each month in which the representative daily maximum effluent temperature for that month exceeds the acute WQBEL. The representative daily maximum effluent temperature is the greater of the following:
  (a) The highest recorded representative daily maximum effluent temperature
  (b) The projected 99th percentile of all representative daily maximum effluent temperatures
- A sub−lethal limitation for temperature is recommended for each month in which the representative weekly average effluent temperature for that month exceeds the weekly average WQBEL. The representative weekly average effluent temperature is the greater of the following:
  (a) The highest weekly average effluent temperature for the month.
  (b) The projected 99th percentile of all representative weekly average effluent temperatures for the month

Comparing the representative highest effluent temperature to the calculated effluent limits determines the reasonable potential of exceeding the effluent limits. The months in which limitations are recommended are shown in bold. Based on this analysis, a weekly average temperature maximum limit is necessary for the month of November.

A dissipative cooling (DC) study was approved in 2014 and the facility has stated that there have been no substantial changes in operation or thermal loadings to the treatment facility since the study. It was

concluded that the effluent likely does not have a significant impact on the fish and aquatic life in the receiving water and that there is a zone of free passage. Therefore, temperature limits are not recommended in the reissued permit. **Monitoring is recommended to continue in the reissued permit.**

Future WPDES Permit Reissuance
DC requests must be re-evaluated every permit reissuance. The permittee is responsible for submitting an updated DC request prior to permit reissuance. Such a request must either include:
a) A statement by the permittee that there have been no substantial changes in operation of, or thermal loadings to, the treatment facility and the receiving water; or
b) New information demonstrating DC to supplement the information used in the previous DC determination. If significant changes in operation or thermal loads have occurred, additional DC data must be submitted to the Department.

PART 6 – WHOLE EFFLUENT TOXICITY (WET)

WET testing is used to measure, predict, and control the discharge of toxic materials that may be harmful to aquatic life. In WET tests, organisms are exposed to a series of effluent concentrations for a given time and effects are recorded. Decisions below related to the selection of representative data and the need for WET limits were made according to ss. NR 106.08 and 106.09, Wis. Adm. Code. WET monitoring frequency and toxicity reduction evaluation (TRE) recommendations were made using the best professional judgment of staff familiar with the discharge after consideration of the guidance in the *Whole Effluent Toxicity (WET) Program Guidance Document (October 29, 2019).*

- Acute tests predict the concentration that causes lethality of aquatic organisms during a 48 to 96-hour exposure. To assure that a discharge is not acutely toxic to organisms in the receiving water, WET tests must produce a statistically valid LC_{50} (Lethal Concentration to 50% of the test organisms) greater than 100% effluent, according to s. NR 106.09(2)(b), Wis. Adm Code.
- Chronic tests predict the concentration that interferes with the growth or reproduction of test organisms during a seven-day exposure. To assure that a discharge is not chronically toxic to organisms in the receiving water, WET tests must produce a statistically valid IC_{25} (Inhibition Concentration) greater than the instream waste concentration (IWC), according to s. NR 106.09(3)(b), Wis. Adm Code. The IWC is an estimate of the proportion of effluent to total volume of water (receiving water + effluent). The IWC of 76% shown in the WET Checklist summary below was calculated according to the following equation, as specified in s. NR 106.03(6), Wis. Adm Code:

$$IWC\ (as\ \%) = Q_e \div \{(1 - f)\ Q_e + Q_s\} \times 100$$

  Where:
  Q_e = annual average flow = 2.75 MGD = 4.255 cfs
  f = fraction of the Q_e withdrawn from the receiving water = 0
  Q_s = ¼ of the 7-Q_{10} = 5.3 cfs ÷ 4 = 1.3 cfs
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), a synthetic (standard) laboratory water may be used as the dilution water and primary control in acute WET tests, unless the use of different dilution water is approved by the Department prior to use. The primary control water must be specified in the WPDES permit.
- According to the *State of Wisconsin Aquatic Life Toxicity Testing Methods Manual* (s. NR 219.04, Table A, Wis. Adm. Code), receiving water must be used as the dilution water and primary control in chronic WET tests, unless the use of different dilution water is approved by the Department prior to use. The dilution water used in WET tests conducted on Outfall 001 shall be a grab sample collected from the receiving water location, upstream and out of the influence of the mixing zone and any other known

discharge. The specific receiving water location must be specified in the WPDES permit.

- Shown below is a tabulation of all available WET data for Outfall 001. Efforts are made to ensure that decisions about WET monitoring and limits are made based on representative data, as specified in s. NR 106.08(3), Wis. Adm Code. Data which is not believed to be representative of the discharge was not included in reasonable potential calculations. The table below differentiates between tests used and not used when making WET determinations.

WET Data History

Date Test Initiated	Acute Results LC_{50} %				Chronic Results IC_{25} %				Footnotes or Comments
	C. dubia	Fathead minnow	Pass or Fail?	Used in RP?	*C. dubia*	Fathead Minnow	Pass or Fail?	Use in RP?	
07/28/2005	> 100	> 100	Pass	Yes	> 100	> 100	Pass	Yes	
04/20/2006	> 100	> 100	Pass	Yes	> 100	> 100	Pass	Yes	
01/09/2007	> 100	> 100	Pass	Yes	> 100	> 100	Pass	Yes	
10/23/2008	> 100	> 100	Pass	No	> 100	> 100	Pass	No	1
07/07/2009	> 100	> 100	Pass	No	> 100	> 100	Pass	No	1
04/20/2010	> 100	> 100	Pass	No	> 100	> 100	Pass	No	1
01/25/2011	> 100	> 100	Pass	No	> 100	> 100	Pass	No	1
11/13/2012					> 100	> 100	Pass	Yes	
01/29/2013	> 100	> 100	Pass	Yes	> 100	> 100	Pass	Yes	
06/04/2013	> 100	> 100	Pass	Yes	> 100	> 100	Pass	Yes	
06/16/2015	> 100	> 100	Pass	Yes	> 100	> 100	Pass	Yes	
08/23/2016	> 100	> 100	Pass	Yes	> 100	> 100	Pass	Yes	
05/02/2017	> 100	> 100	Pass	Yes	> 100	> 100	Pass	Yes	
11/06/2018	> 100	> 100	Pass	Yes					
07/16/2019	> 100	> 100	Pass	Yes	> 100	> 100	Pass	Yes	
11/06/2019					86.3	> 100	Pass	Yes	
01/07/2020	> 100	> 100	Pass	Yes	62.7	> 100	Fail	Yes	
02/04/2020					> 100	> 100	Pass	Yes	
02/18/2020					> 100	> 100	Pass	Yes	

Footnotes:

1. *Tests done by S-F Analytical, July 2008 – March 2011.* The DNR has reason to believe that WET tests completed by SF Analytical Labs from July 2008 through March 31, 2011 were not performed using proper test methods. Therefore, WET data from this lab during this period has been disqualified and was not included in the analysis.

- According to s. NR 106.08, Wis. Adm. Code, WET reasonable potential is determined by multiplying the highest toxicity value that has been measured in the effluent by a safety factor, to predict the likelihood (95% probability) of toxicity occurring in the effluent above the applicable WET limit. The safety factor used in the equation changes based on the number of toxicity detects in the dataset. The fewer detects present, the higher the safety factor, because there is more uncertainty surrounding the predicted value. **WET limits must be given, according to s. NR 106.08(6), Wis. Adm. Code, whenever the applicable Reasonable Potential equation results in a value greater than 1.0.**

  Acute Reasonable Potential = [(TUa effluent) (B)(AMZ)]
  Chronic Reasonable Potential = [(TUc effluent) (B)(IWC)]

According to s. NR 106.08(6)(d), Wis. Adm. Code, TUa and TUc effluent values are equal to zero whenever toxicity is not detected (i.e. when the LC_{50}, IC_{25} or $IC_{50} \geq 100\%$).

Acute Reasonable Potential = 0 < 1.0, reasonable potential is not shown, and a limit is not required.

Chronic Reasonable Potential = [(TU_c effluent) (B)(IWC)]

Chronic WET Limit Parameters

TUc (maximum) $100/IC_{25}$	**B** (multiplication factor from s. NR 106.08(6)(c), Wis. Adm. Code, Table 4)	IWC
100/62.7= 1.59	3.8 Based on 2 detects	76%

[(TUc effluent) (B)(IWC)] = 4.6 > 1.0

Therefore, reasonable potential is shown chronic WET limits using the procedures in s. NR 106.08(6) and representative data from 07/28/2005 to 02/18/2020.

Expression of WET limits

Chronic WET limit = [100/IWC] TU_c = 1.3 TU_c expressed as a monthly average

The WET checklist was developed to help DNR staff make recommendations regarding WET limits, monitoring, and other related permit conditions. The checklist indicates whether acute and chronic WET limits are needed, based on requirements specified in s. NR 106.08, Wis. Adm. Code. The checklist steps the user through a series of questions, assesses points based on the potential for effluent toxicity, and suggests monitoring frequencies based on points accumulated during the checklist analysis. As toxicity potential increases, more points accumulate, and more monitoring is recommended to ensure that toxicity is not occurring. A summary of the WET checklist analysis completed for this permittee is shown in the table below. Staff recommendations based on best professional judgment are provided below the summary table. For guidance related to reasonable potential and the WET checklist, see Chapter 1.3 of the WET Guidance Document: https://dnr.wisconsin.gov/topic/Wastewater/WET.html.

WET Checklist Summary

	Acute	**Chronic**
AMZ/IWC	Not Applicable. **0 Points**	IWC = 76%. **15 Points**
Historical Data	11 tests used to calculate RP. No tests failed. **0 Points**	14 tests used to calculate RP. 1 test failed. **0 Points**
Effluent Variability	Little variability, no violations or upsets, consistent WWTF operations. **0 Points**	Same as Acute. **0 Points**
Receiving Water Classification	WWSF **5 Points**	Same as Acute. **5 Points**

Attachment #1

	Acute	Chronic
Chemical-Specific Data	Reasonable potential for limits for no substances based on ATC; Ammonia nitrogen limit carried over from the current permit. Ammonia, chloride, copper, mercury, chloride, and zinc detected. Additional Compounds of Concern: Benzo(ghi)perylene **5 Points**	Reasonable potential limits for chloride based on CTC; Ammonia, copper, mercury, and zinc detected. Ammonia nitrogen limit carried over from the current permit. Additional Compounds of Concern: Benzo(ghi)perylene **10 Points**
Additives	0 Biocides and 1 Water Quality Conditioners added. P treatment chemical other than Ferric Chloride (FeCl), Ferrous Sulfate ($FeSO_4$), or alum used: No **1 Points**	All additives used more than once per 4 days. **1 Points**
Discharge Category	1 Industrial Contributor: Kemps Dairy **5 Points**	Same as Acute. **5 Points**
Wastewater Treatment	Secondary or Better **0 Points**	Same as Acute. **0 Points**
Downstream Impacts	No impacts known **0 Points**	Same as Acute. **0 Points**
Total Checklist Points:	**16 Points**	**36 Points**
Recommended Monitoring Frequency (from Checklist):	1x yearly	1x yearly
Limit Required?	No	Yes Limit = 1.3 TU_c
TRE Recommended? (from Checklist)	No	No

- After consideration of the guidance provided in the Department's WET Program Guidance Document (2019) and other information described above, annual acute and chronic WET tests are recommended in the reissued permit. Tests should be done in rotating quarters to collect seasonal information about this discharge. WET testing should continue after the permit expiration date (until the permit is reissued).
- A minimum of annual chronic monitoring is required because a chronic WET limit is required. Federal regulations in 40 CFR Part 122.44(i) require that monitoring occur at least once per year when a limit is present.
- A minimum of annual acute and chronic monitoring is recommended because Cedarburg is a major municipal discharger with a design flow greater than 1.0 MGD. Federal regulations at 40 CFR Part 122.21(j) require at least 4 acute and chronic WET tests with each permit application on samples collected since the previous reissuance. Therefore, annual monitoring is recommended in the permit term, so that data will be available for the next permit application.

Attachment #2

Temperature limits for receiving waters with unidirectional flow

(calculation using default ambient temperature data)

Facility: Cedarburg

Outfall(s): 001

Date Prepared: 11/9/2021

Design Flow (Qe): 2.75 MGD

Storm Sewer Dist. 0 ft

7-Q_{10}: 5.30 cfs

Dilution: 25%

f: 0

Stream type: Small warm water sport or forage fish co

Qs:Qe ratio: 0.3 :1

Calculation Needed? YES

	Temp Dates	**Flow Dates**
Start:	01/01/20	04/01/17
End:	12/31/20	09/30/21

Month	Water Quality Criteria			Receiving Water Flow Rate (Qs)	Representative Highest Effluent Flow Rate (Qe)		f	Representative Highest Monthly Effluent Temperature		Calculated Effluent Limit	
	Ta (default)	Sub-Lethal WQC	Acute WQC		7-day Rolling Average (Qesl)	Daily Maximum Flow Rate (Qea)		Weekly Average	Daily Maximum	Weekly Average Effluent Limitation	Daily Maximum Effluent Limitation
	(°F)	(°F)	(°F)	(cfs)	(MGD)	(MGD)		(°F)	(°F)	(°F)	(°F)
JAN	33	49	76	11	2.435	2.801	0	51	52	61	103
FEB	34	50	76	13	2.798	3.081	0	50	51	62	105
MAR	38	52	77	23	3.991	4.812	0	50	51	65	107
APR	48	55	79	48	3.657	4.105	0	53	54	70	120
MAY	58	65	82	26	5.981	8.614	0	58	59	70	94
JUN	66	76	84	13	2.515	2.963	0	64	66	84	97
JUL	69	81	85	9.1	2.838	3.387	0	67	69	87	92
AUG	67	81	84	8.2	3.557	4.528	0	70	71	86	89
SEP	60	73	82	9.1	4.889	5.965	0	67	69	77	87
OCT	50	61	80	11	3.561	4.880	0	64	65	66	91
NOV	40	49	77	16	2.485	2.843	0	61	62	58	111
DEC	35	49	76	13	3.000	3.565	0	55	55	59	100

Attachment #3